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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,566	09/16/2003	Robert J. L. Chimenti	RDH-0315	4165
27810	7590	10/07/2005	EXAMINER	
EXXONMOBIL RESEARCH AND ENGINEERING COMPANY			CROSS, LATOYA I	
P.O. BOX 900			ART UNIT	
1545 ROUTE 22 EAST			PAPER NUMBER	
ANNANDALE, NJ 08801-0900			1743	

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/663,566

Applicant(s)

CHIMENTI ET AL.

Examiner

LaToya I. Cross

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 U.S.C. § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-16, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "said orthogonalized IR absorbance spectrum" in line 2.

There is insufficient antecedent basis for this limitation in the claim.

Claim 13 also recites "an accuracy that renders the invention useful to the application".

What do Applicants intend by this statement. What accuracy renders the invention useful?

Claims 16 and 25 contain the limitation "said average prediction error" for which there is insufficient antecedent basis in the claim.

### ***Claim Rejections - 35 U.S.C. § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-12 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,420,041 to Matsushita et al (hereinafter Matsushita et al '041) in view of US Patent 5,681,749 to Ramamoorthy (hereinafter Ramamoorthy '749).

Matsushita et al '041 disclose a method for determining acid value by infrared absorption. The method of Matsushita et al '041 involves determining the acid value attributed to the carboxylic groups based on the infrared absorption spectrum at wave numbers around  $3300\text{ cm}^{-1}$ . The method is used to determine the acid value of mineral oils such as engine oils. See col. 2, lines 32-36 and 48-52. Matsushita et al '041 disclose using wave numbers in the spectral ranges of  $1710\text{ cm}^{-1}$  to  $4000\text{ cm}^{-1}$ , specifically  $3120\text{ cm}^{-1}$  to  $3300\text{ cm}^{-1}$  and  $2530\text{ cm}^{-1}$ . See examples. It appears from figures 2 and 4 that the absorbances are between 1 and 2 absorbance units and the acid values are in ASTM TAN.

Matsushita et al '041 use a calibration curve to represent the correlation between absorbance and acid value. The [Partial] Least Squares method is used to determine coefficients necessary in calculating the acid value from the calibration curve (col. 4, line 50 - col. 5, line 17). Matsushita et al '041 does not teach correlating the IR absorption spectrum with acid values using linear multivariant regression analysis.

Ramamoorthy '749 teaches several mathematical techniques for correlating infrared spectrum to the concentration of any component in the source stream including acid. Ramamoorthy '749 specifically discloses techniques such as Multiple Linear Regression and Partial Least Squares Regression (col. 12, line 26 - col. 13, line 62). It appears that these methods are equivalent and known in the art.

Thus, it would have been obvious to one of ordinary skill in the art to determine acid values of mineral oils by using IR radiation such as disclosed by Matsushita et al '041 and to correlate the IR spectrum to acid value using any of several known mathematical techniques,

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including Multivariant Linear Regression. The use of such mathematical techniques allows for the development of quantitative chemical analyses.

With respect to the particular petroleum stream used, as recited in claims 8, 9, 15 and 23, it is submitted that the method would be sufficient to determine acid content in any stream, since the method is taught generally for determining acid content, absent evidence to the contrary.

Therefore, for the reasons set forth above, Applicants' claimed invention is deemed to be obvious within the meaning of 35 U.S.C. 103 in view of the teachings of Matsushita et al '041 and Ramamoorthy '749.

***Allowable Subject Matter***

5. Claims 13-16, 24 and 25 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 13-16 are directed to using orthogonalized IR absorbance spectrum to develop a prediction regression model having regression factors to predict the TAN of the petroleum streams. The prior art of record do not teach such orthogonalization to predict the acid values.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaToya I. Cross whose telephone number is 571-272-1256. The examiner can normally be reached on Monday-Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MONIQUE T. COLE  
PRIMARY EXAMINER